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(56) Documents Cited

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(54) Abstract Title

**Radiotelephone having graphic control pointer device located on rear detachable pack**

(57) A portable electronic instrument (e.g. a mobile phone) having a display screen 105 on the front face of the device, and a pointing device 109 located opposite to this on the rear face. Actioning the pointing device (which may be a touchpad 109, trackball or joystick) moves a graphic pointer 106 on the screen. The positioning device may be located on a detachable battery pack or module on the rear of the instrument, so that no modification of the instrument body is needed to incorporate the pointer. Thus the instrument body can be adapted for different needs by changing type of pointer. The pointing device can be used with the screen of the instrument itself or with the screen of another device connected to the instrument (410, figure 4).

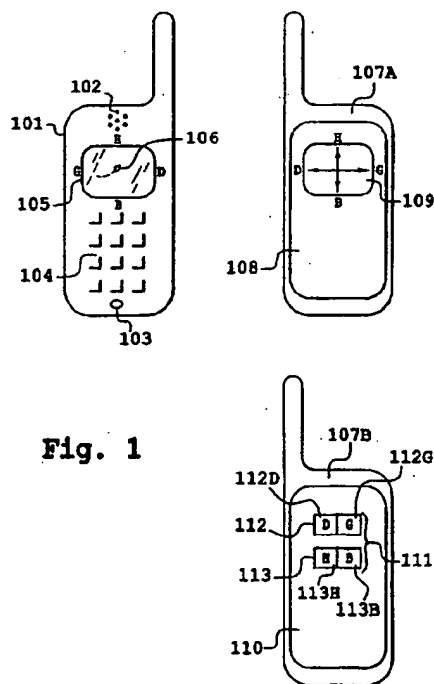
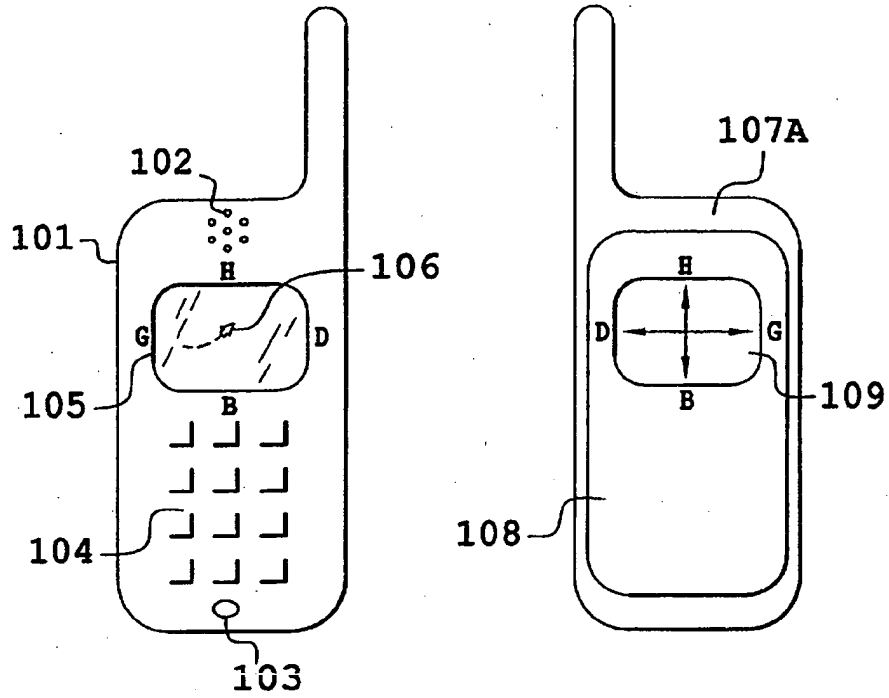
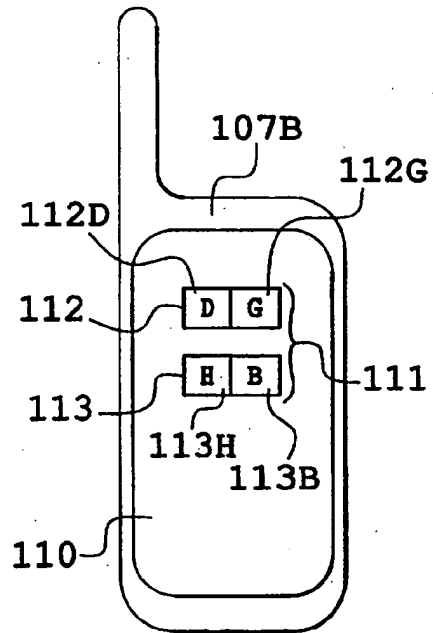


Fig. 1

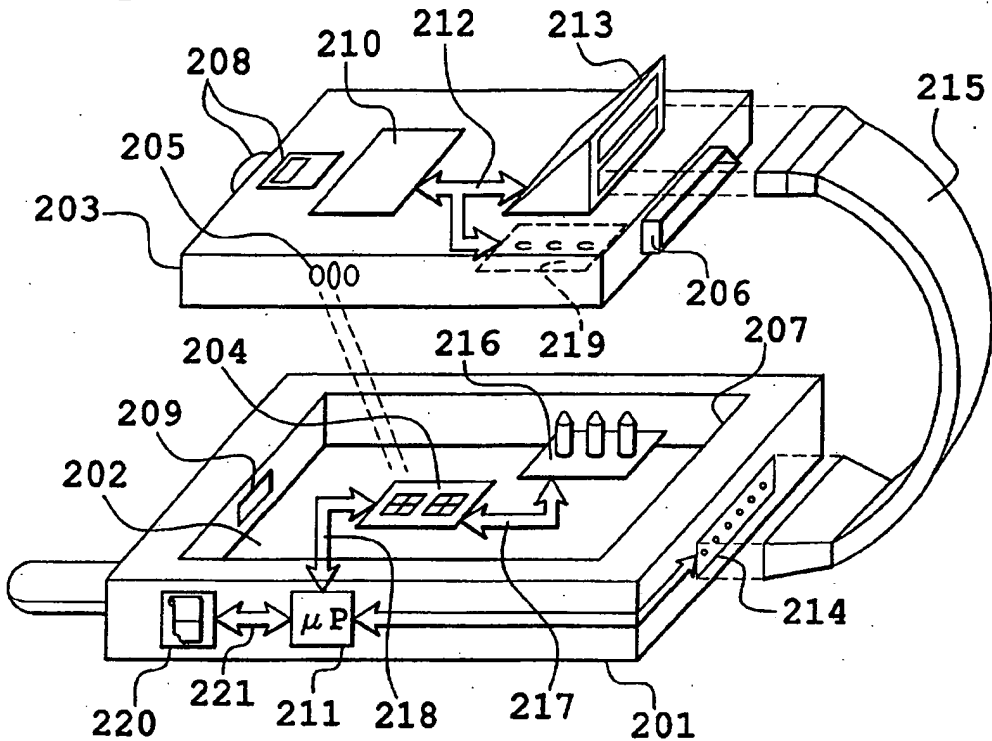
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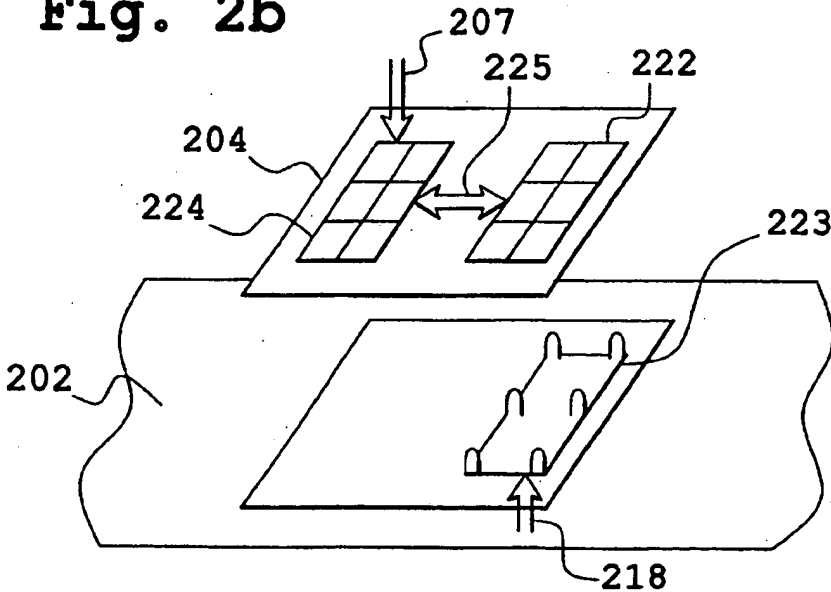
**Fig. 1**



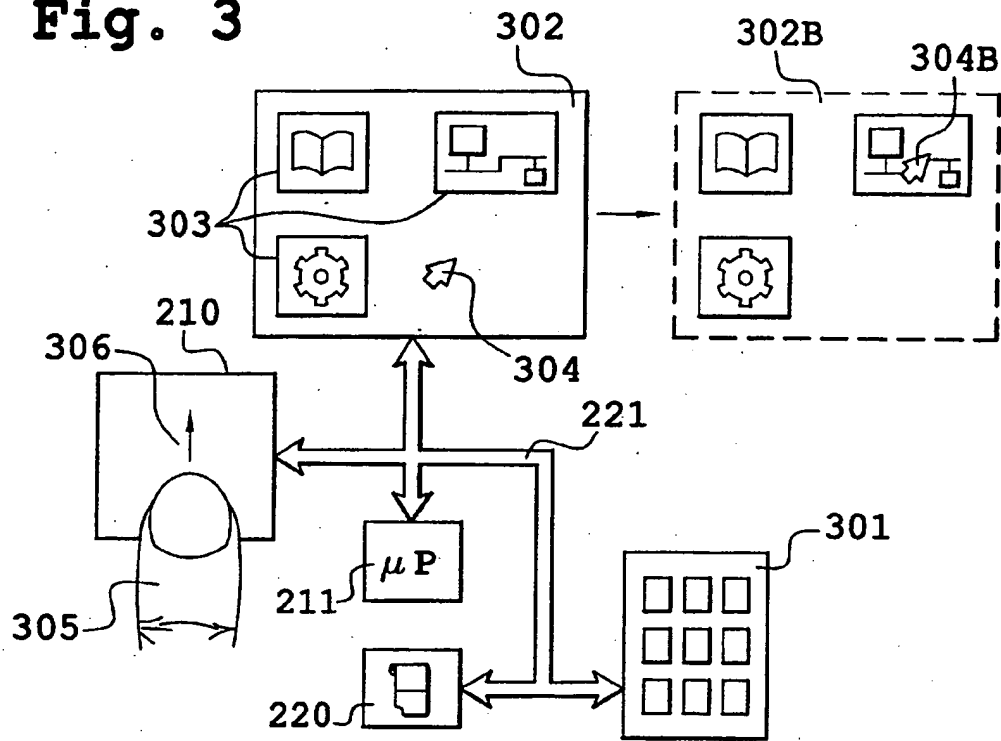
**Fig. 2**



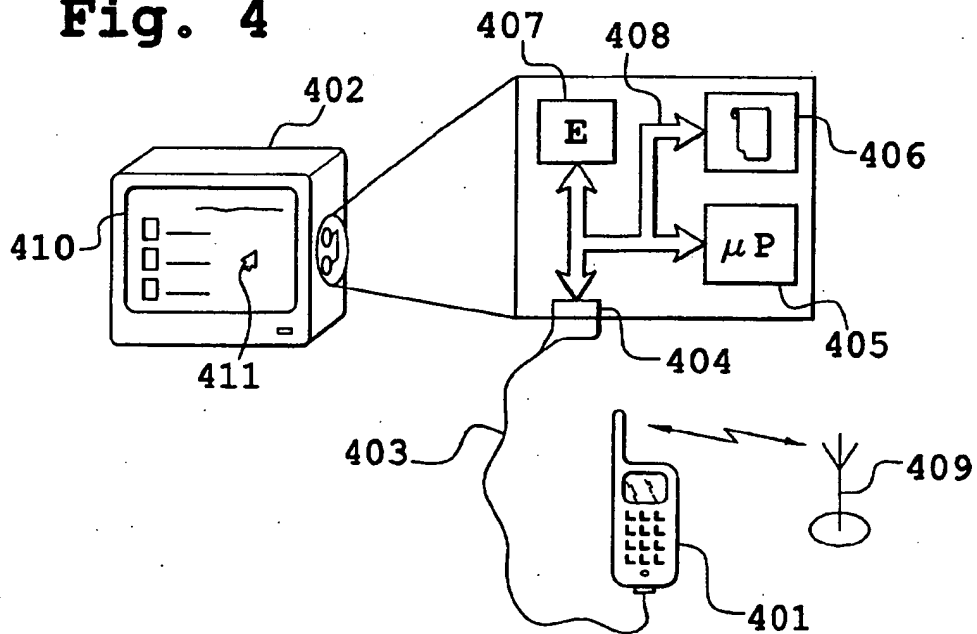
**Fig. 2b**



**Fig. 3**



**Fig. 4**



screen that he has selected. This pressure will make a microprocessor of the mobile telephone perform a program corresponding to the user's wishes.

In a preferred embodiment, the device 109 is located so as to be centered on the screen zone. This gives the user of a telephone according to the invention the impression that his finger is moving directly behind the screen and thus facilitates the use of the pointing device 109.

A rear face 107b has a battery 110 and a pointing device 111 consisting of two sensitive zones 112 and 113. The zone 112 is accessible through the forefinger and the zone 113 is accessible through the middle finger. In one example, the zone 112 is used for horizontal movements and the zone 113 for vertical movements. However, the role of these zones may well be reversed. The zones 112 and 113 are themselves divided into two zones. If the mobile telephone 101 is held with its front face before the user, the zone 112 has a zone 112D located to the right and a zone 112G located to the left of the observer. The zone 113 comprises a zone 113H located to the right and a zone 113B located to the left. However, in the case of the zone 113, which is useful for vertical movements, the zones 113H and 113B can have their positions reversed. With this device 111, when the user acts on the zone 112D, the cursor will shift rightwards. When the user acts on the zone 112G the cursor will shift leftwards. For the zone 113H the cursor will shift upwards and for the zone 113B the cursor will shift downwards. The selected zone is validated through a key of the keyboard 104. The sensitive zones 112 and 113 are made by means of touch-screen technologies.

Figure 2 shows a mobile telephone 201 having a cavity 202 on its rear face, namely the face where there is no screen. This cavity 202 is designed to receive a battery 203. The cavity 202 of the telephone 201 has a location 204 for a SIM card. The battery 203 may also comprise points 205 whose role is to set up contact between the battery 203 and the SIM card. For its attachment, the battery 203 has a foot 206 and a pushbutton 208. To position the battery 203, the foot 206 is placed in a slot 207 designed for this purpose in the cavity 202 and then the pushbutton 208 is activated so that it gets positioned in a slot 209 designed for this purpose in the cavity 202. If it is assumed that the battery 203 has the shape of a rectangular parallelepiped, then the foot 206 and the pushbutton 208 are located on the

smallest faces of the parallelepiped corresponding to the top and bottom of the mobile telephone.

The battery 203 also has a pointing device 210. The pointing device may be made as described here above for Figure 1 but it also may need a trackball. A trackball is a ball enclosed in a container having sensors to measure the motions of the ball. The only motions permitted for the ball are rotational motions about any axis passing through its center. In another embodiment, the pointing device 210 may be a joystick, namely a rod that is can be shifted like the joystick of an aircraft around a position of equilibrium. The deviations of the handle from this position of equilibrium indicate the direction in which a cursor will move on the screen. The joystick is then protected by a protuberance of the pack that contains it. This protuberance prevents the handle from being used involuntarily or from deteriorating when the telephone according to the invention is handled.

There are several ways of connecting the device 210 to a microprocessor 211 of the telephone 201. The first approach consists in connecting the device 210 to a port 213 by means of a bus 212. The port 213 is fixed to a battery on the same face as the device 210. This port 213 is then connected to a port 214 of the mobile telephone 201. To do this, a cable 215 is used. The port 214 exists in standard form on all mobile telephones. It connects the mobile telephones to different existing peripherals, especially to a computer for example. When this approach is chosen, the port 213 is duplicated so that it is possible to continue to connect the mobile telephone to other peripherals. It can be noted that, to be able to connect the mobile telephone to other peripherals, it is also possible to have the cable connected at one of its ends to another peripheral.

A second approach consists in implanting a connector in the foot 206 and in the slot 207. Each element 206 and 207 comprises a part of the connector. The part of the connector corresponding to the foot 206 is connected to the pointing device 210 by a bus. The part of the connector corresponding to the slot 207 is connected to the microprocessor 211 by a bus. Once the battery is in position in the cavity 202, the device 210 is connected to the microprocessor 211. This approach is more elegant since it requires no external element joined to the telephone 201.

A third approach lies in providing the cavity 202 with retractable pins 216. The SIM card is itself connected by a bus 218 to the microprocessor 211. The pins 216 are connected by a bus 217 to the SIM card 204, more specifically to the bus 218 connecting the SIM card and the microprocessor 211. The battery 203 is then provided with a plate 219 which, once the battery is in position in the mobile telephone, faces the pins 216. The plate 219 has contacts, each contact corresponding to a pin. The plate 219 and its contacts are connected to the pointing device 210 by means of the bus 212. Thus, when the battery is in position, the pins 216 are retracted and provide a contact with the plate 219. The microprocessor 211 is therefore able, through a program contained in the memory 220 with which it is connected through a bus 221, to take account of the actions performed on the device 210.

For this arrangement to be possible, a two-faced SIM card is used. Figure 2b shows the SIM card 204 which has a zone 222 of contacts. The zone 222, once the card 204 is in position in the telephone 201, sets up contact between the card 204 and pins 223. These pins 223 are connected to the bus 218. The elements 222, 223 and 218 are therefore used to set up the connection between the microprocessor 220 and the card 204. The zone 222 is on the face of the card 204 which faces the pins 223. On the other face of the card 204, there is a zone 224 which is a replica of the zone 222. This means that, for each contact of the zone 222, there is a corresponding contact of the zone 224. Thus, it can be said that the zones 222 and 224 are connected by a bus 225. The zone 224 in turn is connected to the bus 207. In one alternative embodiment, the plate 219 has pins that come directly into contact with the zone 224. This embodiment dispenses with the bus 207 and the pins 216.

This approach is valuable because it provides for a simple structure of the device 210. Indeed, there are touch-sensitive transparent films. These films have wires to transmit the analog signals delivered by these films. Thus, to make the device 210, a film of this kind can be bonded to the rear face of the battery. A ramification of the film comprising the wires is in contact with the plate 219. Thus, the device 210 is positioned without any major modification of the battery 203 except for an electrical interface

between the signals delivered by the film and the signal processing circuits produced by the film.

Of course, only one of the three devices described is needed to set up communications between the device 210 and the microprocessor 211.  
5 There may be other such devices too.

Figure 3 shows the microprocessor 211, the memory 220, the pointing device 210, a keyboard 301 and a screen 302. The elements 301, 302, 210, 211 and 220 are connected together by the bus 221. In the example of figure 3, the device 210 is of the heat-sensitive touchpad type. The screen  
10 302 shows different keys 303. A key is a zone of the screen that has dimensions is smaller than those of the screen and contains a symbol or text that schematically depicts or indicates a function. If there are several keys on one and the same screen, the keys are not generally superimposed. The screen 302 also shows a pointer 304. A user will move a finger 305 on the  
15 surface of the device 210 in a direction 306. The microprocessor 211 retrieves data on this motion through the bus 221. This data is processed by the microprocessor 211 which is controlled by a program contained in the memory 220. This program then moves the cursor 304 on the screen 302 as a function of the motion in the direction 306.

20 In the present case, once the processing is done, the display of the screen 302 becomes the display 302b. Since the motion in the direction 306 is an upward motion, the cursor is above the position that it has in the screen 302. The display of the pointer 304b is superposed on the display of a key. The user can now decide to press the device 210 or one of the keys of the  
25 keyboard 301. In doing so, he will send a piece of information to the microprocessor 211 which knows the position of the pointer and the keys on the screen. Depending on the position of the pointer, the microprocessor will perform a program containing the memory 220.

30 The positioning of a pointing device on a mobile telephone converts this mobile telephone into a pointing device itself. Indeed, a mobile telephone contains all the means needed to set up a secured remote link. It is therefore very well possible, with a mobile telephone of this kind, to envisage an application where there is a large-sized monitor 402 connected by RF links, or wire links 403, to the mobile telephone 401.



Figure 4 shows that the monitor 402 has a port 404 providing connection with the telephone 401. In the example of Figure 4, the connection is a wire telephone but it could be an RF connection. The monitor 402 also has a microprocessor 405, a memory 406 and an interface circuit 407 with a display device 410 of the monitor 402. The elements 404 to 407 are connected by a bus 408. The microprocessor 405, controlled by a program contained in the memory 406, reads the information present on the port 404 and shapes it before transmitting it to the circuit 407 which interfaces between the data to be displayed and the display device 410. The information read by the microprocessor is data to be displayed as well as data relating to the movement of a cursor 411. The device 410 may be a cathode-ray tube or any other equivalent means such as a plasma screen or a liquid crystal display screen. The circuit 407 then converts the digital data sent to it into analog data capable of being displayed on the device 410.

The mobile telephone 401 is itself connected for example to the Internet through a base station 409 and the data that it receives is displayed on the large-sized monitor. The pointing device in the mobile telephone is then used to point to the large-sized monitor. For the display on the large-sized monitor, it is enough to send this monitor the data corresponding to the contents of a page of the kind that can be found on the Internet, namely text in the HTML (hyper text markup language) code. When the pointing device of the telephone 401 is acted upon, the cursor 411 moves on the device 410. The pointing device cannot be seen because it is placed behind the telephone 401 which is seen in a front view in Figure 4.

In this example, the mobile telephone is thus used as a modem and a pointing device. The monitor 402 can be seen as a television set provided with certain abilities of a computer such as the management of a pointing device and the interpretation of the HTML code.

## CLAIMS

1. A portable electronic instrument comprising a screen on a front face, wherein the instrument comprises:

- 5       - a pointing device located on a rear face of the instrument and located on a detachable pack of the instrument,  
      - means to shift a graphic pointer on the screen of the instrument as a function of an action on a pointing device.

10       2. An instrument according to claim 1, wherein the pointing device is constituted by two zones, one accessible through the forefinger and the other through the middle finger, corresponding to horizontal and vertical movements of the pointer.

15       3. An instrument according to one of the claims 1 or 2, wherein the pointing device comprises means to detect a pressure on the part of the user.

      4. An instrument according to one of the claims 1 to 3, wherein the pointing device is a temperature-sensitive or touch-sensitive motion sensor.

20       5. An instrument according to claim 4, wherein the zone covered by the sensor on the rear face is centered on the zone covered by the screen on the front face.

      6. An instrument according to one of the claims 1 to 5 comprising a keyboard, wherein a key of this keyboard, when depressed, initiates an action depending on the position of the pointer on the screen of the instrument.

25       7. An instrument according to one of the claims 1 to 6, wherein the pointing device is a ball of the computer mouse type or trackball type.

      8. An instrument according to one of the claims 1 to 7, wherein the pointing device is a joystick.

30       9. An instrument according to one of the claims 1 to 8, wherein the device is a portable telephone.

      10. An instrument according to one of the claims 1 to 9, wherein the device is a personal digital assistant.

      11. A use of an instrument according to one of the claims 1 to 11 wherein:

- 35       - the portable electronic instrument is connected to a second

instrument comprising a screen and needing a pointing device for an application.

12. An instrument substantially as hereinbefore described with reference to figures 1 to 4 of the drawings.



Application No: GB 0018079.4  
Claims searched: 1-12

Examiner: Eleanor Thurston  
Date of search: 7 February 2001

## Patents Act 1977 Search Report under Section 17

### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): H4J (JK), H4L (LBUF)

Int Cl (Ed.7): H04M 1/03

Other: Online: EPODOC, WPI, PAJ

### Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2348337 A (ISHIGAMI) see figs. 1A & 1B, page 9 para. 3 and abstract.	1, 3, 4, 6, 9
X	GB 2339505 A (ISHIGAMI) see figs. 1A & 1B, and abstract.	1, 3, 4, 9
X	GB 2330982 A (PRIOR et al) see figs. 3, 6, 7-9 & 11, and abstract.	1, 3, 4, 7-9
X	GB 2330981 A (PRIOR et al) see figs. 3, 6, 7-9 & 11, and abstract.	1, 3, 4, 7-9
X	WO 00/31948 A1 (HEITSCH) see figs. 1, 2, 5 & 7, and abstract.	1, 4, 7-9

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.